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ABSTRACT

A study investigated the differences in comprehension among 54 second grade students of differing reading abilities who either did nor did not receive basal reading instruction with interspersed postquestions, using the same reading series. Two factors, entering reading level and use of interspersed postquestions, were combined factorially to form six experimental groups. The dependent variable was the children's score on the comprehension subtest of the SRA Achievement Series. Results showed that while questioning instruction had little effect on the above average reader, both average and below average readers made significant gains in comprehension when instructed in the use of postpassage questions. Students, therefore, must develop a strategy for dealing with textual material and so must be provided with experience in using a questioning strategy. This approach may begin to help students internalize a strategy that will offer them the skills necessary for independent reading. (Tables provide a common lesson format for teaching and for means and standard deviations on the SRA criterion measure, while a figure illustrates interaction of dependent measure by reading ability groups.) (SRT)

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Interspersed Post-Passage Questions and Reading Comprehension Achievement

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Abstract

This study examined the effect of interspersed post-passage questions on comprehension for second grade children. Readers of three levels of reading achievement were either instructed in the use of questions or taught reading in a regular fashion. Results from the reading comprehension subtest of the S.R.A. Achievement Series showed that while questioning instruction had little effect on the above average readers, both normal and below average readers made significant gains in comprehension when instructed in the use of post-passage questions. The results are described in terms of strategy development.

Interspersed Post-Passage Questions and Reading Comprehension Achievement

An important variable for learning from prose appears to be the degree to which readers process textual material. Numerous mathemagenic devices have been shown to increase learners immediate and delayed recall. The use of inserted questions is one method which seems to be an effective aid in children's learning textual material. Moreover, it seems that post-passage questions facilitate test performance more than pre-questions (Frase, 1967, 1968a, 1968b; Rothkopf and Bisbicos, 1967). More recent research indicates that interrogatives placed before a passage tend to limit inspection to specific (critical) content and to focus the attention of the reader on the relatively small number of words needed to answer the question (Frase, 1973; Rothkopf and Billington, 1974). Hence the interspersed question that is introduced before the passage is read seems to help the reader locate specific content while they are reading. Conversely, questions that appear after the passage may promote both specific discrimination and the acquisition of nonreferent (incidental) material (Frase, 1970). Clearly, the bulk of the research in this area has used adult samples. Citing this problem, Swenson and Kulhavy (1974) attempted to extend these findings to school age children. They found that interspersed post-questions strongly facilitated comprehension for relevant material. However, the learning of nonreferent (incidental) material was not facilitated to the degree as had been shown with adults.

In an attempt to replicate Swenson and Kulhave's findings, Yost, Avilla, and Vexler (1977) sought " ...to determine the effect on learning of science content of having students respond to questions of varying complexity following segments of instruction" (p. 399). Again, the results showed that the groups that verbalized responses to interspersed post-questions did significantly better than those groups which completed various other instructional material. Although, these findings seem to be generalizable, at least one report indicated no significant difference between treatment groups of children that mentally answered interspersed qeustions and treatment groups that completed blanks in a cloze procedure (Daugherty, 1971).

In sum, it would seem that post-questions facilitate test performance on relevant material more than pre-questions (Frase, 1967, 1968a, 1968b; Rothkopf and Bisbicos, 1967). So too, the effects of asking interspersed questions on an intermittent schedule is no better and perhaps worse than at regular intervals (Rothkopf, 1972). Finally, of importance to reading instruction, as practiced today, two studies found that orally asked questions which required students to verbalize a response was superior in facilitating learning (Rothkopf and Bloom, 1970; Rothkopf, 1972).

Reading instruction in the classroom differs to a large degree from the controls of the laboratory. As Fisher, Filby, and Marliave (1977) point out, second grade students have a daily mean allocation of between 47 minutes to 118 minutes of reading instruction per school day. Within this wide range of daily instructional time, "textbooks and

workbooks dominate the teaching-learning process" (Goodlad, 1970, p. 81). With regard to the reading instruction that does occur, Chall and Staiger have reported that between 80% to 95% of American schools implement a commercially prepared basal reading series as their approach to reading instruction. (Chall, 1967; Staiger, 1969).

Based on Chall (1967) and Staiger's (1969) data, a picture develops that portrays the basal reading series as the predominate feature in developmental reading instruction. It also seems that teachers follow basal reading series manuals as a script rather than an suggestions for instructional practices, particularly during the initial years of teaching.

Interestingly, from the point of view of inserted questions, Durkin (1978) reports that teachers devote the largest portion of the reading period (18%) to comprehension questioning. Moreover, it seems that the majority of the questions asked by teachers come directly from the basal reading manual. Speaking from these data, Durkin (1978) suggests that teachers could improve their questioning by avoiding: "excessive page by page questioning (like that found in primary grade basal manuals)... because it is likely to disrupt the continuity of a selection..." (Durkin, 1980, p. 455).

Weintraub (1969) recommends establishing a purpose for reading pre-reading questions) and asking children about what they read (post-reading questions) as a necessary instructional practice. Howver, review of the literature in this area reveals conflicting results. When children "read to find out how..." before they read a passage, it does

not appear to facilitate comprehension (Ballard, 1965, Pettit, 1971; Snavely, 1962). Fincke and Landry also found that placing questions before a reading passage does not consistently facilitate increased comprehension as compared to no-question groups (Fincke, 1968; Landry, 1967).

A survey of current basal reading texts has revealed interspersed questions are included in the instructional guidelines for teacher instruction. Jenkins and Pany (1981) argues that: "the results of the question/purpose setting studies does not yield clear signs for practitioners. However, since the interspersed questions sometimes elicit more attention from the reader, teachers may wish to use them in reading (p. 186)." Indeed, a conflict exists within the published literature. On one hand, Durkin (1980) prefers to label inserted questions as a source of discontinuity in a reading selection, based upon her observational research that teachers do not teach comprehension. On the other hand, a review of the literature demonstrates that four research paradigms commonly used have both a general and specific forward process and backward process. Adjunct questions have been demonstrated to have a direct instructive effect (Rothkopf, 1966) and an indirect effect (Anderson and Biddle, 1975). The majority of the published literature demonstrates the facilitative effect of adjunct questions on adult populations. However, very little research has been conducted in the elementary school setting with instructional materials under controlled conditions. Those studies published have assessed the effect on content material in the middle or junior high grades.

Additionally, Rickards (1979) cites four research paradigms for assessing the effects of adjunct questions. These commonly used methods do not follow a paradigm that could be described as instructional. Furthermore, the studies are conducted over one set of textual materials and one period of reading those materials. Unlike the classroom, these materials appear to be a laboratory situation for testing the effects of adjunct questions.

In addition, we were interested in examining the possible transfer effect of inducing mathemagenic strategies in dealing with textual material. Since, adjunct qeustions are available to teachers in basal reading materials, the purpose of the present research was to examine the effects of asking interspersed questions, when implemented in the teachers' editions of a basal reader with second grade readers. In light of the published literature showing a direct instructive effect for adjunct interspersed questions, we investigated whether this effect could be elicited in such an approach to basal readers. Clearly, the literature reports findings that were established with contrived textual materials in artificial settings. If this effect is measurable with typical instructional practices, the implications to the classroom are obvious.

To this end, the present experiment investigated the differences in comprehension between groups of second grade students of different reading ability who either received basal reading instruction with interspersed post-qeustions or did not using the same reading series.

Method

The subjects for this study were drawn from all of the students entering second grade at an elementary school in Indianapolis, Indiana during the Fall Term, 1983. Any student that had repeated first grade or who was scheduled to receive in-school reading tutoring services or outside clinical reading intervention were excluded from the study. According to these guidelines four students were excluded from the final pool of available students. Fifty-four students, 93% of the entering second grade class, were then randomly assigned to one of two second grade classrooms. The pool of students contained 32 boys, 59% of the sample, and 22 girls, 41% of the sample. Minority students composed 7% of the entire sample. The mean age of the second graders was 7.28 years.

Design

Two factors, entering reading level and use of interspersed post-questions, were combined factorially to form six experimental groups. The design was thus a 3 reading level (high vs. middle vs. low) X 2 treatment (control vs. interspersed post-passage questions) factorial. The dependent variable was the children's score on the comprehension subtest of the SRA Achievement Series (Level B/Form 1).

Students, in the original pool of entering second grade students, were assigned to one of three reading ability groups on the basis of their scores on the Houghton-Mifflin Reading Series Placement Test which was given at the beginning of the second grade school year. The top third of the students' scores were placed in the above average group;

the middle third were placed in the average group; the bottom third were placed in the below average group. From within each of these groups, subjects were randomly assigned to either a treatment instruction group or the control instruction group.

Materials and Procedures

After randomizing the students to either treatment or control groups, the students and two second grade teachers were given the first two weeks of classes to get acquainted with their students and accomplish the typical beginning of the year activities. The researcher met with the two classroom teachers to discuss the experimental design, and to insure that the teachers understood the implementation of interspersed questions, in conjunction with the basal series.

Starting the third week of the fall term, reading instruction began. Both the experimental and the control groups received instruction from each of the two teachers assigned to second grade. The teacher that was randomly assigned to begin instruction with the treatment group provided reading instruction using interspersed post-questions for the first four weeks of the study. Then that same teacher provided instruction to the control group, without the interspersed post-questions, for the final four weeks of the instructional period of the study. In this manner, during the full eight week period, both groups were instructed with identical basal texts, under their respective interspersed questioning condition by both of the second grade teachers to control for teaching style and students' preferences for a given teacher. The researcher visited both classrooms four unscheduled times to insure that instructional practices were being followed and to answer teachers questions.

Both classes of students started in the second grade reader in the Houghton-Mifflin Reading Series. Both groups covered one story per week; therefore all students were exposed to eight selections. The instructional week was restricted to one story simply because the above average groups, control and experimental, covered stories faster than the below average groups. In this manner, both groups at all six levels could be kept on the same story during a given week. In the experimental condition, small group instruction with the three reading ability levels required the students to verbally interact with the teacher as she covered the interspersed post-passage comprehension development questions in a page by page fashion as they read the selections. The students were not allowed to look back at the textual material once the page had been read. The control group reading ability levels covered the same selections in small group instruction without implementing the optional interspersed post-passage comprehension development questions. Both groups, experimental and control, answered in written form, the end of the story comprehension assessment questions to comply with the teacher's grading needs. Table 1 outlines the reading lesson plan followed by both teachers in introducing and covering each of the eight selections.

Insert Table 1 about here

During the eight week experimental period of instruction, the subjects did not receive any additional reading instruction outside the procedures outlined above. Additionally, the teachers agreed to suspend

workbook activities, for this time period, as a control against complimentary instruction in comprehension skills.

Results

Each subjects' response to the S.R.A. Achievement Series, Level B/Form 1 comprehension subtest were scored for the total number correct out of twenty-five items. These data were entered into a 2 treatment group (adjunct questions vs. no questions) X 3 reading levels (below average vs. average vs. above average) analysis of variance. The means and standard deviations for the dependent measure by group are presented in Table 2.

Insert Table 2 about here

The results indicated a significant main effect for treatments, $F(1, 48) = 23.77$, $p < .001$, with the adjunct question group exceeding the performance of the no question group. The main effect for reading level was also significant, $F(2, 48) = 76.49$, $p < .001$. These results must be qualified by the two-way interaction of treatment and reading level which was significant, $F(2, 48) = 5.47$, $p < .008$.

The six means contributions to this interactions are displayed in Figure 1. This portrayal shows, and contrasts confirm, the observation that while interspersed question instruction had little effect for above average readers ($p > .05$) both average and below average readers profited significantly ($p < .05$) from instruction with interspersed questions.

Insert Figure 1 about here

Discussion

The present results replicate the Swenson and Kulhavy (1974) study in terms of the facilitating effects of post-passage questions with children. Indeed, such questions aid in the comprehension and retention of relevant material. However, the present experiment was unique in that an attempt was made to measure the transfer of the question strategy taught in conjunction with basal reading instruction. Obviously, this approach offers a new possible direction for instructional practices regarding basal reading in the primary grades. Support for this approach is evidenced by the signficiant effect for question instruction on an independent measure of reading comprehension. The interaction of post-passage question instruction and reading ability level established the greater importance of implementing this instructional practice with average and below average readers. It seems that for above average readers instruction in post-passage questions strategy was less effective in that no significant difference between the instructional practices were found for this group. From solely an instructional viewpoint this is not surprising, for above average readers tend to learn and apply strategies independently (Dean and Kulhavy, 1978). Clearly the instruction of the problem reader is a far more critical problem in the implementation of any instructional procedure. The present findings are

important because below average readers were shown to differently benefit in the comprehension and retension of textual materials as shown in the answering of questions typically used to measure reading performance.

Given the often cited dependence on basal reading programs, especially in the early primary years (Barton and Wilder, 1964; Chall, 1967), the present results would suggest the teaching of the mathemagenic strategy of interspersed post-passage questions as part of the reading instruction. This point of view is consistent with Jenkins and Pany (1981) suggestion to investigate the effects of teacher questioning on the development of children's comprehension.

Several reading strategies have been shown to enhance learning from text. Among these are general strategies involving imagery, paraphrasing, self-checking, and corrective feedback (see Jenkins and Pany, 1981). In each case these strategies are externally imposed upon readers in an attempt to build an internal heuristic for dealing with comprehending textual material. Consistent with these findings, the present study offers the initial foundation for the instructional practice of implementing externally applied questioning techniques. Such instruction may promote an internal strategy or heuristic to enable the reader at the initial stages of basal reading instruction, to develop a strategy in the processing of an retention of relevant textual material. In the present study it would seem that processing of basal stories was modified by the introduction of interspersed post-passage questions in the average and below average treatment groups. During the eight weeks of training in the use of inserted questions, it would seem that a transfer effect for strategy

occurred. Indeed, this was shown in the post treatment dependent measure between the average and below average treatments and their respective control groups. Apparently, the above average readers had spontaneously developed a comprehension strategy as shown by the fact that above average readers in both treatment and control groups did not differ on the dependent measure. The conclusion that above average readers spontaneously apply such strategies is consistent with prior research in which the use of adjunct aid is related to advanced verbal ability (Dean and Kulhavy, 1978).

Evidence for the transfer effect comes from the fact that the S.R.A. Reading Comprehension subtest was the dependent measure. Although this measure tested reading comprehension, at second grade level, the stimulus materials were different from those used in instruction. It should be pointed out that the S.R.A. duplicated the reading format students are exposed to in most classroom instruction. Namely, connected discourse and accompanying comprehension questions. Many diagnostic reading tests measure reading comprehension by selecting from among several alternatives the word that fits into a cloze blank in one or more sentences. This is a good measure for testing general reading comprehenshion, however since it cannot be taught as a strategy from which to process text effectively, it has little utility in the classroom.

The potential for teaching primary students to use a questioning strategy to deal with the comprehension and retention of connected discourse is clear. As Stauffer (1969) points out, critical readers require the ability to utilize three critical skills. Initially, the ability to

ask relevant questions and form hypothesizes about the textual material. Then, this enables the reader to begin to process text in a systematic manner. In this manner, if the hypothesis that the reader forms is accurate based on one's ability to process the text then the reader will get validating answers to the initial questions.

It would seem that the student must develop a strategy for dealing with textual material. Thus, an important part of any reading instruction must be an attempt to provide students with experience in implementing a questioning strategy. As demonstrated in this present study, this approach may begin to assist students in internalizing a strategy that will offer them the skills necessary as independent readers.

Table 1

Common Lesson Format for Instructional Sessions

Both teachers will cover all eight selection following this instructional format with the exception of the additional experimental condition for the treatment group.

1) Introduce the story by reading the basal synopsis about the selection from the Teacher's Edition (TE) to the students.

2) Introduce the outlined new vocabulary from the TE for the selection so that students can apply decoding skills and read for meaning when the story is covered during the small group session.

3a) CONTROL GROUP: Silent reading of the selection by ability groups.

3b) EXPERIMENTAL GROUP: Silent reading of the selection and implementation of the optional interspersed post-passage, page by page, comprehension development questions under the conditions required.

4) After the entire selection has been covered by an ability group under either control or experimental conditions (3a or 3b) the teacher will conduct the written end of the story comprehension questions for their grading needs.

5) No other basal TE manual activities or instructional worksheets will be utilized during these eight weeks of instruction.

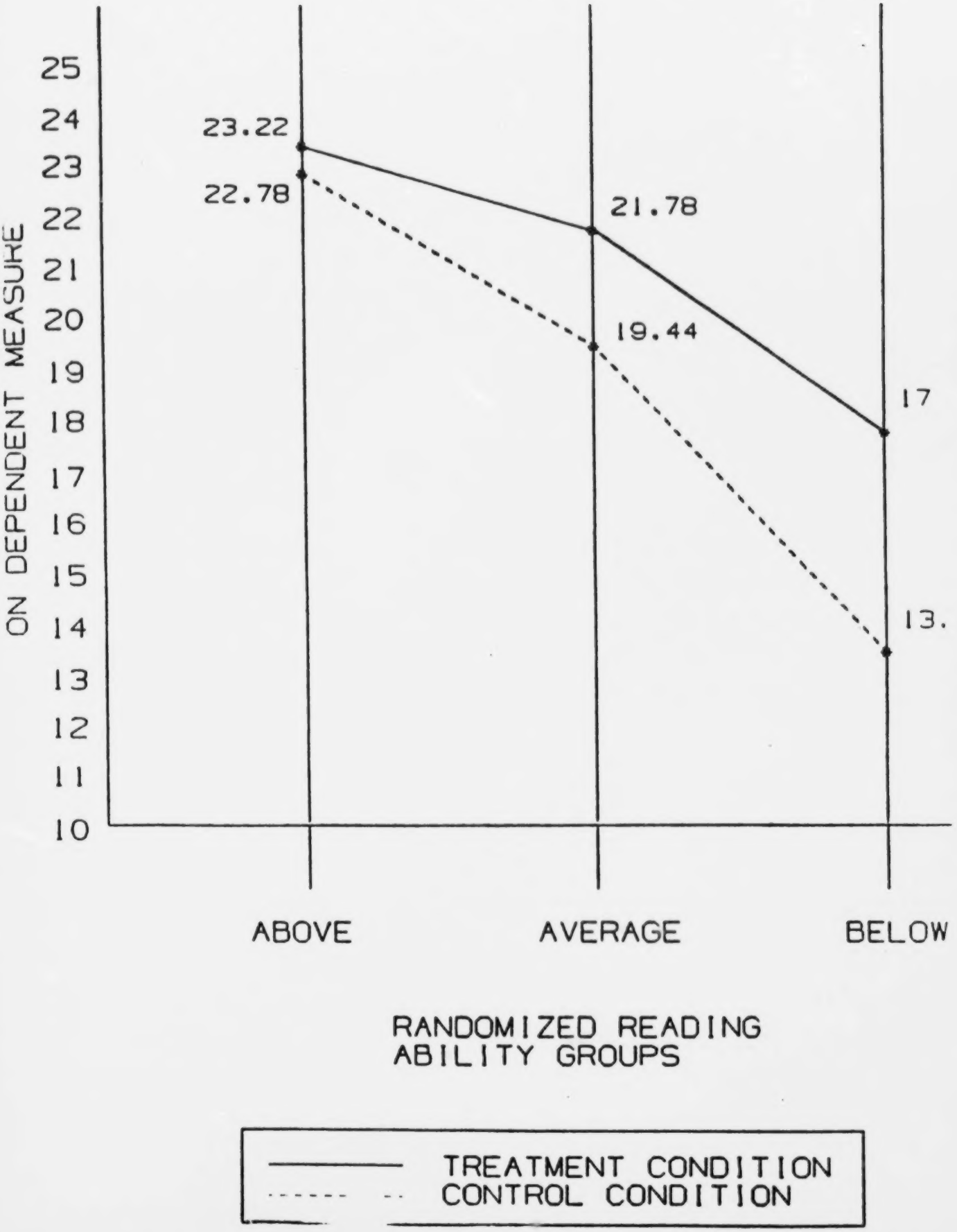
Table 2

MEANS AND STANDARD DEVIATIONS ON S. R. A. CRITERION MEASURE BY TREATMENT GROUPS.

		ABOVE RDG. GRP.	AVERAGE RDG. GRP.	BELOW RDG. GRP.
TREATMENT GRPS	$\bar{X}$	23.22	21.78	17.89
	S. D.	1.09	1.30	2.42
CONTROL GRPS	$\bar{X}$	22.78	19.44	13.44
	S. D.	1.09	1.51	2.74

Figure Caption

Figure 1: Graphic Representation of Interaction of Dependent Measure by Reading Ability Groups.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ABOVE
AVERAGE
BELOW
RANDOMIZED READING
ABILITY GROUPS
TREATMENT CONDITION
CONTROL CONDITION

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